DETAILED ACTION

Election/Restrictions

1. Restriction is required under 35 U.S.C. 121 and 372.

This application contains the following inventions or groups of inventions which are not so linked as to form a single general inventive concept under PCT Rule 13.1.

In accordance with 37 CFR 1.499, applicant is required, in reply to this action, to elect a single invention to which the claims must be restricted.

Group I, claim(s) 1-10, are drawn to a method and kit for manufacturing a dental prosthesis by way of a casting method to create a dual ceramic layer.

Group II, claim(s) 11-19, are drawn to a method and kit for manufacturing a dental prosthesis on a Zirconia frame to create a dual ceramic layer.

2. The inventions listed as Groups I-II do not relate to a single general inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, they lack the same or corresponding special technical features for the following reasons: the common technical feature in all groups is the dual ceramic layer. This element cannot be a special technical feature under PCT Rule 13.2 because the element is shown in the prior art. US Patent 6,740,267(made of record by the applicant) teaches the use of a casting method in order to create a dual ceramic layer on a dental prosthesis. The reference specifically suggests using this type of ceramic coating in the production of dental parts.

3. During a telephone conversation with Sam Dangremond on August 21, 2008 a provisional election was made with traverse to prosecute the invention of Group I, claims 1-10.

4. Affirmation of this election must be made by applicant in replying to this Office action. Claims 11-19 stand withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

[Action on the merits follows]

Specification

5. Applicant is reminded of the proper language and format for an abstract of the disclosure.

The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of 50 to 150 words. It is important that the abstract not exceed 150 words in length since the space provided for the abstract on the computer tape used by the printer is limited. The form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

The language should be clear and concise and should not repeat information given in the title. It should avoid using phrases which can be implied, such as, "The disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," etc.

6. The abstract of the disclosure is objected to because the abstract is 180 words long. Correction is required. See MPEP § 608.01(b).

Claim Objections

7. Claim 7 is objected to because of the following informalities: "porcelain" (line 10) is spelled incorrectly. Appropriate correction is required.

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

9. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

10. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

11. Claims 1-4, 6-8, and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sekino et al. (USP No. 6,740,267 – made of record by the applicant) in view of Janjic (USP No. 3,934,348 – made of record by the applicant).

12. Regarding claim 1 Sekino teaches a method of manufacturing a dental prosthesis **(Method of Producing Ceramic Crowns)**, by comprising: a step of preparing a substrate **(Ceramic Core, see abstract)** of the dental prosthesis that is constituted by a dental molding material **(ceramic)**; a step of forming a casting mold such that the substrate is disposed in the casting mold **(see figures 2 and 3-- which shows the utilization of a casting mold)** and such that a void **(empty cavity is left after wax pattern is sintered out, column 3, lines 20-25)** is provided on a surface of the back coating layer; and a step of forming a cast coating layer on at least a part of a surface of the back coating layer, by pouring **(applying)** a second porcelain into the void **(applying at least one kind of dental porcelain onto the surface of a ceramic core molded by heating, see abstract)** at a casting temperature, wherein the second porcelain is constituted principally by ceramic whose composition is different from that of the ceramic of the first porcelain such that viscosity of the second porcelain at the casting temperature is lower than that of the first porcelain. **[(Column 2, lines 20-25 -- shows that the additional ceramic layer is poured into the mold at a viscous state of 10^2 to 10^6) while (Column 4, lines 15-20 -- states that during the molding of the ceramic core the viscosity of the ceramic is between 10^2 to 10^9)→ this shows that the first porcelain layer (core) can have a higher viscosity than the 2nd layer]**

a. Although Sekino suggests the use of multiple ceramic layers it does not explicitly teach a step of forming a back coating layer on at least a part of a surface of the substrate, by using a first porcelain that is constituted principally by ceramic.

b. With respect to claim 1, in the same field of endeavor of creating a dual ceramic layer dental prosthesis, Janjic teaches a step of forming a back coating layer **(See figures 6 and 7 – showing an opaque porcelain layer on the substrate)** on at least a part of a surface of the substrate, by using a first porcelain that is constituted principally by ceramic. **(Column 1, lines 20-62).** It would have been obvious to one skilled in the art to modify Sekino with the teachings of Janjic for the benefit of including a back coating layer of porcelain on the substrate. This would have been obvious because Sekino suggested (see figure 1) that multiple ceramic layers can be added to the substrate (ceramic core) in order to create a more lifelike dental prosthesis.

13. Regarding claim 2, Sekino still remains applied to claim 1 above.

c. Sekino teaches wherein the casting mold forming step includes: a sub-step of forming, on at least a part of the surface of the back coating layer, a model layer **(Wax pattern)** made of a material that is eliminable by burning thereof **(Column 3, lines 20-25)**, a sub-step of embedding **(filling between mold ring and tooth shaped model)** the model layer in a matrix **(Investment material)** constituting the casting mold; and a sub-step of forming the casting mold, which is provided with the void corresponding to the model layer, by

burning and eliminating the model layer after hardening the matrix. **(Column 3, lines 20-40)**

14. Regarding claim 3, Sekino still remains applied to claim 1 above.

d. Sekino teaches wherein the substrate is a frame made of metal or ceramic. **(See abstract—discussing a method for applying at least one kind of dental porcelain onto the surface of a ceramic core)**

15. Regarding claim 4, Sekino still remains applied to claim 1 above.

e. Sekino teaches wherein the first porcelain is provided by a porcelain whose viscosity at the casting temperature is at least 1.5 times as high as that of the second porcelain. **[(Column 2, lines 20-25 -- shows that the additional ceramic layer is poured into the mold at a viscous state of 10^2 to 10^6) while (Column 4, lines 15-20 -- states that during the molding of the ceramic core the viscosity of the ceramic is between 10^2 to 10^9)→ this shows that the first porcelain layer (core) can have a higher viscosity(1.5 times and higher) than the 2nd layer]**

16. Regarding claim 6, Sekino still remains applied to claim 1 above.

f. Sekino teaches wherein the viscosity of the first porcelain at the casting temperature ranges from 2 x 106 (cP) to 5 x 107 (cP), while the viscosity of the second porcelain at the casting temperature ranges from 1 x 106 (cP) to 3 x 107 (cP). **[(Column 2, lines 20-25 -- shows that the additional ceramic layer is poured into the mold at a viscous state of 10^2 to 10^6) while (Column 4, lines**

15-20 -- states that during the molding of the ceramic core the viscosity of the ceramic is between 10^2 to 10^9)]

17. Regarding claim 7, Sekino teaches the kit comprising: a second material constituted principally by ceramic for preparing a second porcelain that forms, by casting **(pouring)**, a coating layer on a surface of at least a part of the back coating layer **(applying at least one kind of dental porcelainonto the surface of a ceramic core molded by heating, see abstract)**, wherein viscosity of the second porcelain at a casting temperature is lower than that of the first porcelain. **[(Column 2, lines 20-25 -- shows that the additional ceramic layer is poured into the mold at a viscous state of 10^2 to 10^6) while (Column 4, lines 15-20 -- states that during the molding of the ceramic core the viscosity of the ceramic is between 10^2 to 10^9)→ this shows that the first porcelain layer (core) can have a higher viscosity than the 2nd layer]**

g. Although Sekino suggests the use of multiple ceramic layers it does not explicitly teach a first material constituted principally by ceramic for preparing a first porcelain that forms a back coating layer on the surface of the substrate;

h. With respect to claim 1, in the same field of endeavor of creating a dual ceramic layer dental prosthesis, Janjic teaches a first material constituted principally by ceramic for preparing a first porcelain that forms a back coating layer on the surface of the substrate. **(see figures 6 and 9 – showing the addition of a opaque porcelain layer).** It would have been obvious to ones skilled in the art to modify Sekino with the teachings of Janjic for the benefit of creating a back coating layer of porcelain on the substrate. This would have been

obvious because Sekino suggested (see figure 1) that multiple ceramic layers can be added to the substrate (ceramic core) in order to create a more lifelike dental prosthesis.

18. Regarding claim 8, Sekino still remains applied to claim 7 above.

i. Sekino teaches wherein the first and second materials are prepared such that the viscosity of the first porcelain at the casting temperature is at least 1.5 times as high as that of the second porcelain. **[(Column 2, lines 20-25 -- shows that the additional ceramic layer is poured into the mold at a viscous state of 10^2 to 10^6) while (Column 4, lines 15-20 -- states that during the molding of the ceramic core the viscosity of the ceramic is between 10^2 to 10^9)→ this shows that the first porcelain layer (core) can have a higher viscosity(1.5 times and higher) than the 2nd layer]**

19. Regarding claim 10, Sekino still remains applied to claim 7above.

j. Sekino teaches wherein the first and second materials are prepared such that the viscosity of the first porcelain at the casting temperature ranges from 2 x 10^6 (cP) to 5 × 10^7 (cP), while the viscosity of the second porcelain at the casting temperature ranges from 1 x 10^6 (cP) to 3 x 10^7 (cP). **[(Column 2, lines 20-25 -- shows that the additional ceramic layer is poured into the mold at a viscous state of 10^2 to 10^6) while (Column 4, lines 15-20 -- states that during the molding of the ceramic core the viscosity of the ceramic is between 10^2 to 10^9)]**

20. Regarding claims 1-4, 6-8, and 10, Sekino and Janjic are both drawn to the manufacturing of a dual ceramic layer dental prosthesis. Sekino teaches a casting method which uses a ceramic core as a substrate and then applying multiple layers of ceramic/porcelain to that substrate. On the other hand, Janjic teaches a molding process that uses a platinum/gold substrate to support additional ceramic layers in order to create a dual ceramic layer dental prosthesis. It would have been obvious to ones skilled in the art to modify Sekino with the teachings of Janjic for the benefit of creating a back coating layer of porcelain on the substrate. This would have been obvious because Sekino suggested (see figure 1) that multiple ceramic layers can be added to the substrate (ceramic core) in order to create a more lifelike dental prosthesis. All the claimed elements were known in the prior art and one skilled in the art could have combined the elements as claimed by known methods with no change in their respective functions, and the combination would have yielded predictable results to one of ordinary skill in the art at the time of invention.

21. Claims 5 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sekino et al. (USP No. 6,740,267 – made of record by the applicant) in view of Janjic (USP No. 3,934,348 – made of record by the applicant) in further view of Brodkin et al. (USP No. 6,428,614).

22. Regarding claim 5, as Sekino and Janjic remain applied to claim 7 above.

k. Although the hypothetical combination of Sekino and Janjic suggests the composition of the ceramic layers it does not explicitly teach wherein the first porcelain has, as a main component, a glass composition that is essentially

constituted by oxides having respective percentage contents as follows: SiO2 40-75 (mass %); A1203 10-20 (mass %); K20 5-15 (mass %); Na20 2-10 (mass %); Li20 0.1-2 (mass %); ZrO2 0-7 (mass %); CaO 0-5 (mass %); MgO 0-5 (mass %); and SnO2 0-30 (mass %); wherein the second porcelain has, as a main component, a glass composition that is essentially constituted by oxides having respective percentage contents as follows: SiO2 6-70 (mass %); A1203 10-20 (mass %); K20 5-15 (mass %); Na20 3-15 (mass %); Li20 0.1-3 (mass %); ZrO2 0-3 (mass %); CaO 0.1-5 (mass %); MgO 0.1-5 (mass %); B203 0-3 (mass %); CeO2 0-3 (mass %); and Sb203 0-7 (mass %).

I. With respect to claim 5, in the same field of endeavor of creating an all ceramic dental prosthesis, Brodkin teaches wherein the first porcelain has, as a main component, a glass composition that is essentially constituted by oxides having respective percentage contents as follows: SiO2 40-75 (mass %); A1203 10-20 (mass %); K20 5-15 (mass %); Na20 2-10 (mass %); Li20 0.1-2 (mass %); ZrO2 0-7 (mass %); CaO 0-5 (mass %); MgO 0-5 (mass %); and SnO2 0-30 (mass %); wherein the second porcelain has, as a main component, a glass composition that is essentially constituted by oxides having respective percentage contents as follows: SiO2 6-70 (mass %); A1203 10-20 (mass %); K20 5-15 (mass %); Na20 3-15 (mass %); Li20 0.1-3 (mass %); ZrO2 0-3 (mass %); CaO 0.1-5 (mass %); MgO 0.1-5 (mass %); B203 0-3 (mass %); CeO2 0-3 (mass %); and Sb203 0-7 (mass %). **(see Tables 3 and 6 showing the composition of the body and incisal porcelain vs. opaque porcelains).** . It

would have been obvious to ones skilled in the art to modify Sekino and Janjic with the teachings of Brodkin for the benefit of a dual layer ceramic which has different physical properties. This would have been obvious because Sekino suggested the use of SiO2, Al2O3, B2O3, ZnO, Na2O, and Li2O when making a ceramic layer and these are all common metal oxides used to make dental ceramics. One having the ordinary skill in the art of making dental ceramics would know to alter these metal oxide compositions in order to change a physical property like that of viscosity. All the claimed elements were known in the prior art and one skilled in the art could have combined the elements as claimed by known methods with no change in their respective functions, and the combination would have yielded predictable results to one of ordinary skill in the art at the time of invention.

23. Regarding claim 9, as Sekino and Janjic remain applied to claim 1 above.

m. Although the hypothetical combination of Sekino and Janjic suggests the composition of the ceramic layers it does not explicitly teach wherein the first porcelain has, as a main component, a glass composition that is essentially constituted by oxides having respective percentage contents as follows: SiO2 40-75 (mass %); A1203 10-20 (mass %); K20 5-15 (mass %); Na20 2-10 (mass %); Li20 0.1-2 (mass %); ZrO2 0-7 (mass %); CaO 0-5 (mass %); MgO 0-5 (mass %); and SnO2 0-30 (mass %); wherein the second porcelain has, as a main component, a glass composition that is essentially constituted by oxides having respective percentage contents as follows: SiO2 6-70 (mass %); A1203

10-20 (mass %); K20 5-15 (mass %); Na20 3-15 (mass %); Li20 0.1-3 (mass %); ZrO2 0-3 (mass %); CaO 0.1-5 (mass %); MgO 0.1-5 (mass %); B203 0-3 (mass %); CeO2 0-3 (mass %); and Sb203 0-7 (mass %).

n. With respect to claim 9, in the same field of endeavor of creating a dual ceramic layer dental prosthesis, Brodkin teaches wherein the first porcelain has, as a main component, a glass composition that is essentially constituted by oxides having respective percentage contents as follows: SiO2 40-75 (mass %); A1203 10-20 (mass %); K20 5-15 (mass %); Na20 2-10 (mass %); Li20 0.1-2 (mass %); ZrO2 0-7 (mass %); CaO 0-5 (mass %); MgO 0-5 (mass %); and SnO2 0-30 (mass %); wherein the second porcelain has, as a main component, a glass composition that is essentially constituted by oxides having respective percentage contents as follows: SiO2 6-70 (mass %); A1203 10-20 (mass %); K20 5-15 (mass %); Na20 3-15 (mass %); Li20 0.1-3 (mass %); ZrO2 0-3 (mass %); CaO 0.1-5 (mass %); MgO 0.1-5 (mass %); B203 0-3 (mass %); CeO2 0-3 (mass %); and Sb203 0-7 (mass %). **(see Tables 3 and 6 showing the composition of the body and incisal porcelain vs. opaque porcelain)**

24. Regarding claims 5 and 9, Sekino, Janjic, and Brodkin are all drawn to the manufacturing of a dual ceramic layer dental prosthesis. Brodkin discloses various compositions that can be used to include a ceramic tooth with various levels of opaqueness. It would have been obvious to ones skilled in the art to modify Sekino and Janjic with the teachings of Brodkin for the benefit of a dual layer ceramic which has different physical properties. This would have been obvious because Sekino suggested

the use of SiO2, Al2O3, B2O3, ZnO, Na2O, and Li2O when making a ceramic layer and these are all common metal oxides used to make dental ceramics. One having the ordinary skill in the art of making dental ceramics would know to alter these metal oxide compositions in order to change a physical property like that of viscosity. All the claimed elements were known in the prior art and one skilled in the art could have combined the elements as claimed by known methods with no change in their respective functions, and the combination would have yielded predictable results to one of ordinary skill in the art at the time of invention.

Conclusion

25. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The reference Sekino et al. (USP No. 6,923,420) which discloses a method for preparing a ceramic artificial crown by casting.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to AMJAD ABRAHAM whose telephone number is (571)270-7058. The examiner can normally be reached on Monday through Friday 8:00 AM to 5:00 PM Eastern Time.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Angela Ortiz can be reached on (571) 272-1206. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

AAA

/Angela Ortiz/

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